

Performance Standards

Turning-Chucking

Material

Cold rolled steel or low carbon steel, $\text{Ø}2'' \times 4.5''$

Duty

Setup and carry out chucking operations for turning.

Performance Standard

Given raw material, part print, hand, precision, and cutting tools, as well as access to an appropriate turning machine and its accessories, produce a part matching the print specifications using appropriate trade techniques and speeds and feeds. The part specified should have at least three diameters within $\pm .005''$, two bores within $\pm .005''$, one UNC external thread, and require at least two chuckings or other workholding setup.

Other Evaluation Criteria

1. Finishes are at least 125 Ra microinches.
2. No sharp edges.

Accuracy Level: $\pm .015$ on all fractions, $\pm .005$ on all decimals unless otherwise specified on the blueprint. Diameters to be coaxial within $.002$ total run out.

Assessment Equipment and Material

Workstation: A common workbench, an engine lathe of 14"X 30" minimum capacity, a three jaw universal scroll chuck, and a four jaw independent chuck. The lathe must have a quick change gear box with the threads called for on the print available from the gear box.

Material: A part matching the material requirements of the turning blueprint, material: Mild steel.

Tooling: Tool post, right and left hand turning tools capable of turning to a square shoulder, an external threading tool matched to the profile of the thread called out on the turning print, a boring bar and boring tool capable of boring to a square shoulder, a drill chuck, centerdrill, and assorted drills necessary to rough out the bore, magnetic base for a dial indicator, thread wires for chucks, files, wrenches as necessary.

Measuring

Instruments: Required micrometers, combination set, thread pitch gages center gage, pitch micrometer, plug gage and thread ring, dial indicator, 6" rule, a 6" vernier, dial, or electronic caliper, telescoping gages or inside calipers, and surface finish comparison plates.

Reference: Machinery's Handbook

Performance Assessment Worksheet

Turning-Chucking

INSTRUCTIONS: Rate the candidate's performance for the Turning- Chucking job according to the criteria below. The checklist below represents only a listing of criteria to be evaluated. It is *not* a sequence of process steps or a process plan for making the part. For each item, check the box under Pass or Fail accordingly.

Remember, NIMS requires that **all** specifications must be met within the allowable tolerance limits. If the part does not meet **all** specifications, the candidate must correct or redo the project.

Candidate Name _____

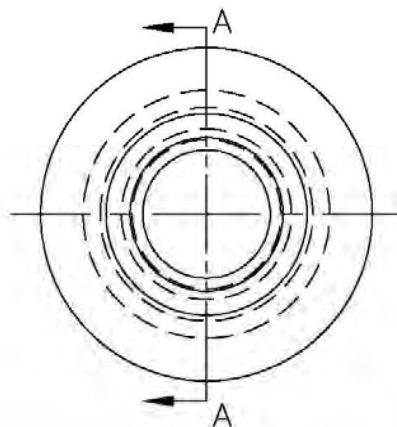
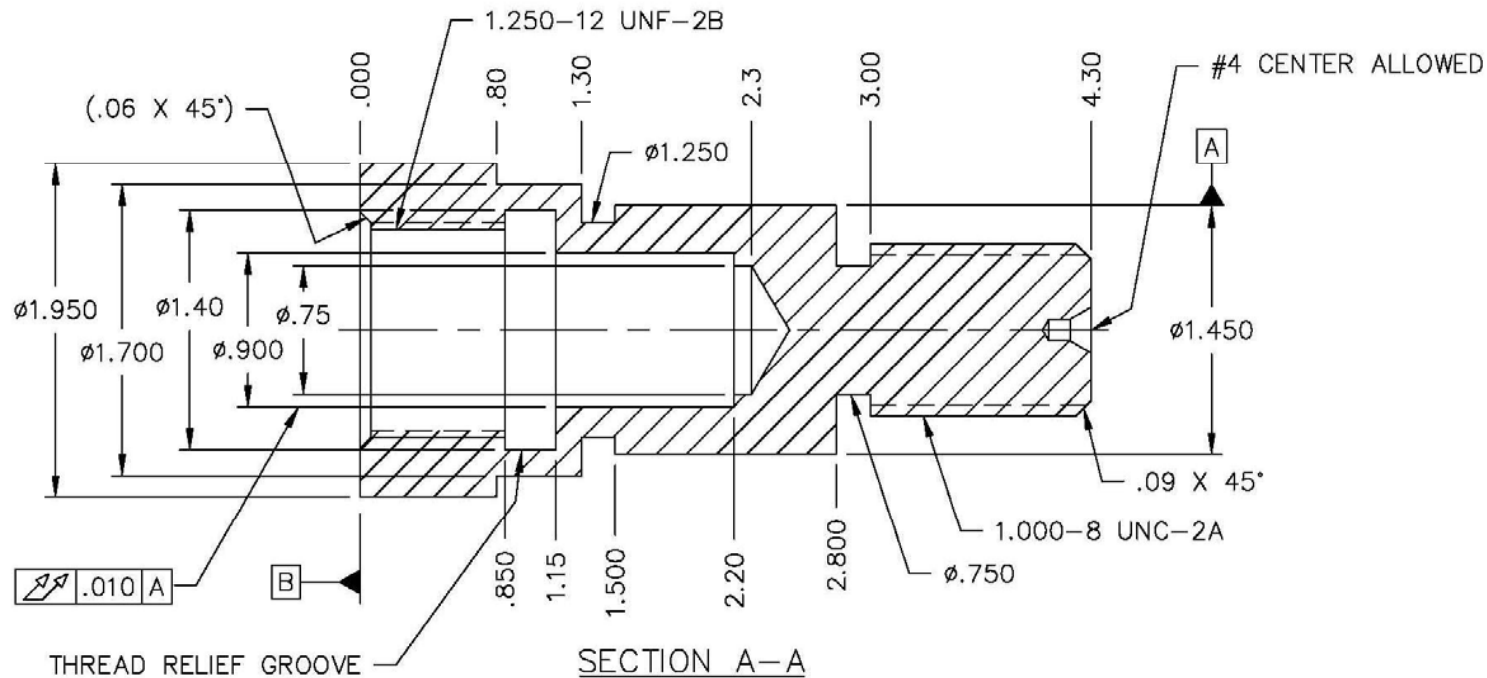
Evaluation Date _____

Performance Project – Turning-Chucking		Pass	Fail
Evaluation Criteria			
1. Length dimensions .80 ± .015 1.30 ± .015 2.800 ± .005 4.30 ± .015	Pass = all dimensions within tolerance Fail = one or more dimensions not within tolerance	<input type="checkbox"/>	<input type="checkbox"/>
2. Outside diameters Ø1.950 ± .005 Ø 1.700 ± .005 Ø1.450 ± .005	Pass = all dimensions within tolerance Fail = one or more not within tolerance	<input type="checkbox"/>	<input type="checkbox"/>
3. Groove dimensions Ø.750 ± .005 Ø1.250 ± .005	Pass = both grooves within tolerances Fail = one or both grooves not within tolerance	<input type="checkbox"/>	<input type="checkbox"/>
4. External thread 1-000-8 UNC 2A thread Pitch diameter: 0.9100 / 0.9168	Pass = Gage “go” compliance or within pitch diameter tolerance Fail = Accepts “no-go” gage or out of pitch diameter tolerance	<input type="checkbox"/>	<input type="checkbox"/>
5. Internal thread 1 .25 -12 UNF - 2B thread	Pass = meets “Go” condition on gage Fail = Accepts “No-go” gage	<input type="checkbox"/>	<input type="checkbox"/>
6. Drill and bore hole 2.20 ± .015 bore depth 2.3 ± .032 drill depth Ø.75 ± .015 drill hole	Pass = all dimensions within tolerance Fail = one or more dimensions out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>

Performance Project – Turning-Chucking		Pass	Fail
Evaluation Criteria			
7. \varnothing .900 bore concentric to datum A .010 TIR	Pass = TIR of .005 or less Fail = TIR exceeds .005	<input type="checkbox"/>	<input type="checkbox"/>
8. Coaxial on all non-threaded diameters .010 TIR on all diameters	Pass = all diameters within TIR callout Fail = one or more diameters exceed TIR callout	<input type="checkbox"/>	<input type="checkbox"/>
9. Bore diameter .900 \pm .005	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
10. External surfaces \perp surfaces to datum B .005	Pass = all surfaces perpendicular within .005 (Reference surface is datum B) Fail = one or more surfaces exceeds .005	<input type="checkbox"/>	<input type="checkbox"/>
11. Surface finish	Pass = 125 Ra microinches or better Fail = over 125 Ra microinches	<input type="checkbox"/>	<input type="checkbox"/>
12. Sharp edges not to exceed .015	Pass = no sharp edges Fail = sharp edges or edge break exceed .015	<input type="checkbox"/>	<input type="checkbox"/>
END OF TURNING-CHUCKING EVALUATION			

It is important to note that the part must be 100% within the tolerances listed on the print. The criteria listed here are a guide for instructors and supervisors. Not every dimension is included in this guide. Nonetheless, the completed part must be 100% within the specifications of the print. The print takes precedence over this guide when the parts are inspected by the MET-TEC committee. The part print and the Performance Affidavit should be sent along with the part to the MET-TEC for evaluation. Send to NIMS only the completed Performance Affidavit, signed by the MET-TEC members. A copy of the Performance Affidavit should be retained in the candidate's file documenting completed performance for this credential.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	UPDATED DRAWING AND TITLE BLOCK	3/7/05	LW



NOTES:

1. FINISH ALL OVER 125 MICROINCHES MAX
2. BREAK ALL SHARP EDGES .015" MAX.
3. EXTERNAL SURFACES: 0.005 B
4. ALL EXTERNAL NON-THREADED DIAMETERS: 0.010 B A

DO NOT SCALE DRAWING

	MACHINING SKILLS LEVEL 1		
	Job Duty 2.4 Turning Operation, Chucking		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994	DESIGNER	DK	11/8/01
TOLERANCES .X ± .032 .XXX ± .005 .XX ± .015 ANGLES ± 1 DEG. FRACTIONS ± 1/64	DWG CHK		MATERIAL COLD ROLL STEEL OR MILD STEEL
	DWG APPD		
	SCALE	FULL	DWG.#98601 SHEET 1 OF 1

NIMS PROCEDURAL REQUIREMENTS

1. SUBMIT THIS PRINT AND WORKPIECE ALONG WITH THE PERFORMANCE AFFIDAVIT FOR EVALUATION